

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III

841 Chestnut Building
Philadelphia, Pennsylvania 19107

MEMORANDUM

DATE: 24 May 1999

SUBJECT: Technical Support Document for the Direct-final Approval of Pennsylvania's 1990 NOx Base Year Inventory for the Philadelphia Severe Ozone Nonattainment Area

FROM: Maria A. Pino, Environmental Engineer
Ozone & Mobile Sources Branch *Maria A. Pino*

TO: File

THRU: David L. Arnold, Chief *DA Arnold*
Ozone & Mobile Sources Branch

Background: Under the Clean Air Act (the Act), States have the responsibility to inventory emissions contributing to national ambient air quality standard nonattainment, to track these emissions over time, and to ensure that control strategies are being implemented that reduce emissions and move areas towards attainment. Section 182(a)(1) of the Act requires states containing ozone nonattainment areas classified as marginal to extreme to submit a final, comprehensive, accurate, and current inventory of actual ozone season, weekday emissions from all sources by November 15, 1992. This inventory is for calendar year 1990, and is denoted as the 1990 base year inventory. It includes both anthropogenic and biogenic sources of volatile organic compounds (VOCs), oxides of nitrogen (NOx), and carbon monoxide (CO). The inventory is to address actual VOC, NOx, and CO emissions for the area during peak ozone season, which is generally comprised of the summer months. All emissions from stationary point and area sources, as well as highway and non-road mobile sources, and biogenic emissions within the nonattainment area, are to be included in the compilation. The 1990 base year emissions inventory is the primary inventory from which other Clean Air Act requirements, including the periodic inventory, the rate-of-progress (ROP) target level and projection inventories, and the modeling inventory, are derived.

On July 31, 1998, the Pennsylvania Department of Environmental Protection (PADEP) submitted a revision to the Pennsylvania State Implementation Plan (SIP) containing the 1990 NOx base year inventory for the Philadelphia severe ozone nonattainment area and the "Phase I" ROP plan for the Philadelphia area. EPA received this revision on August 4, 1998. Pennsylvania held a public hearing for this submittal on March 2, 1998. In an October 2, 1998 letter, EPA determined that the submittal is administratively and technically complete.

This document provides technical support for EPA's rulemaking on Pennsylvania's 1990 NOx base year inventory for the Philadelphia nonattainment area. In a separate rulemaking action, EPA will address the remainder of PADEP's July 31, 1998 submittal related to the Philadelphia area Phase I plan.

Submittal History: On November 12, 1992, Pennsylvania submitted, as a SIP revision, a 1990 base-year inventory for the entire Commonwealth. This inventory covered sources of VOCs, NOx, and CO. On September 12, 1996, PADEP submitted revisions to its VOC and NOx inventory with its 15% plan for the Philadelphia area. PADEP submitted further revisions to its VOC inventory on April 10, 1997. EPA approved PADEP's 1990 base-year VOC emissions inventory for the Philadelphia area on June 9, 1997, in the same notice as EPA's conditional interim approval of the 15% plan (62 FR 31343). EPA approved the 1990 CO inventory for Philadelphia County on January 30, 1996 (61 FR 2926). This approval was effective on December 30, 1997. (See the technical amendments published in the Federal Register on January 6, 1998, 63 FR 415.)

The NOx emissions data contained in PADEP's July 31, 1998 supersedes the data in PADEP's previous submittals. However, PADEP has requested that its prior submissions containing NOx inventory documentation and methodologies remain on file with EPA.

State's Submittal and EPA Evaluation: The following table summarized the 1990 base year emissions data, found in Section 4, 1990 Base Year Inventory, of PADEP's July 31, 1998 submittal. The figures represent the average peak-ozone-season weekday NOx emissions for the major anthropogenic source categories in the Philadelphia area. The inventory includes area, stationary, non-road mobile and mobile sources.

1990 Base Year NOx Emissions for the Philadelphia 5-County Area tons per summer day (tpsd)					
County	Point	Area	Highway	Nonroad	Total
Bucks	15.96	5.36	32.16	13.09	66.57
Chester	26.97	2.84	25.98	11.25	67.04
Delaware	65.51	7.45	18.44	9.23	100.63
Montgomery	7.67	9.13	39.50	20.69	76.99
Philadelphia	45.79	22.34	42.24	17.94	128.31
5-County Area	161.90	47.12	158.32	72.20	439.54

Point Sources

Detailed point source data is found in Appendix III, Point Source Emissions Data, of PADEP's July 31, 1998 submittal. This appendix contains:

- 1) emissions categorized by industrial process for each county,
- 2) point source facility listings for each county,
- 3) detailed point source emissions data for large facilities for each county,
- 4) an explanation of how PADEP compiled its point source list, and
- 5) documentation on PADEP's emission estimation procedures.

Area Sources

Detailed area source data is found in Appendix III, Area Source Emissions Data, of PADEP's July 31, 1998 submittal. This appendix contains area source NOx emissions, by source category, for each county. For the methodology used to calculate emissions for each area source category, PADEP refers to Appendix IV of its 15% plan for the Philadelphia area.

Highway (On-Road) Mobile Sources

PADEP coordinated with the Pennsylvania Department of Transportation (PennDOT) to estimate highway vehicle emissions. PADEP's emission inventory includes eight vehicle classifications, and emission estimates for each county. The MOBILE5 model was used to calculate emission factors. Appendix V, Highway Vehicle Emissions Data, of PADEP's July 31, 1998 submittal contains information about PADEP's emission estimation procedures. For the methodology used to develop the highway vehicle inventory, PADEP refers to Appendix IV of its 15% plan for the Philadelphia area.

Non-Road Mobile Sources

For emissions from non-road vehicles and engines, PADEP relied on data generated by EPA. In November 1991, EPA conducted a study of non-road emissions, considering over 80 different types of equipment. EPA used this study to develop emissions inventories for a number of nonattainment areas, including the Philadelphia area. PADEP drew emissions data for the 5-county Philadelphia area from a spreadsheet, prepared by EPA's Office of Mobile Sources, for the Philadelphia interstate ozone nonattainment area. PADEP refers to its 15% plan for the Philadelphia area for a more detailed discussion of the methodology used to prepare this data.

Recommended Agency Action: EPA approval is recommended.